

Supplementary Materials

The following materials were evaluated as “supplementary materials.” These items show value as teaching materials, but may narrowly focus on a specific energy topic or closely related topic, or they may be a collection of unrelated activities or fact sheets. Evaluators applied the narrative portions of the evaluation tool to these materials; a summary of their notes is provided here.

ACID RAIN

LHS Great Explorations in Math and Science (GEMS)
Lawrence Hall of Science
University of California
Berkeley, CA 94720
510-642-7771
510-643-0309 (fax)
<http://www.lhs.berkeley.edu>

Grades 6-10. \$16 per unit (does not include tax or shipping and handling); 163 pages, 1990.

This unit engages students in discovery activities, brainstorming acid rain solutions and critically evaluating those solutions, and formulating their own opinions about what should be done about acid rain.

Notes: Includes a simulation for students to determine solutions to acid rain. Great teacher instructions. Includes a literature list. Relates acid rain effect on lakes and fish in a realistic manner. Presents a logically organized sequence of lessons. Clear, step-by-step directions. Good upper elementary and middle school activities. Very structured.

TEACHER’S GUIDE TO SUPERCONDUCTIVITY FOR HIGH SCHOOL STUDENTS

National Technical Information Service
U.S. Department of Commerce
5285 Port Royal Rd.
Springfield, VA 22161
703-487-4650/800-553-6847
703-321-8547 (fax)
<http://www.ntis.gov>

High School. Item #PB95141388, \$21.50 plus \$4 shipping and handling; 77 pages plus 12 minute video, 1994.

This handbook and video were developed to help teachers understand, teach, and demonstrate the basic features of superconductivity.

Notes: An excellent physics activity with a video tape. Extensive background information. Many advanced-level exercises. May be intimidating to some teachers. Presents high-level math, including calculus. Requires a lot of specialized equipment, i.e. oxygen tank, pellet press, etc. Would not be used in some classrooms mainly because of materials needed and storage problems with liquid nitrogen. Better equipped schools could do this.

BREAKTHROUGHS (several titles): *Antarctica: Exploration or Exploitation?; Can We Plug Into Windmills?; and Smog, Sore Throats, and Me?*

Zaner-Bloser Inc.
P.O. Box 16764
Columbus, OH 43216-6764

1-800-421-3018
614-487-2699 (fax)

Antarctica: Exploration or Exploitation? (3-4), ***Can We Plug Into Windmills?*** (2-3), and ***Smog, Sore Throats, and Me?*** (3-4). Each package comes with a teachers edition, student response sheets, and a science workbook. Packages are available with 5, 15, or 25 student response sheets for \$24.97, \$59.97, or \$89.97. Materials are available in Spanish.

The topics in “Breakthroughs” are real-world problems, and can supplement various disciplines. Units are developed around a non-graded scope of topics rather than on a scope and sequence of skills.

Notes: Student books have engaging text and pictures. Emphasizes reading information and answering questions. Tries to move to a project approach but is not there yet. Many of the more interesting, integrated ideas are optional. It is not activity based. Addresses thinking strategies.

EARTH MATTERS

Zero Population Growth Inc.
1400 16th St., N.W., Suite 320
Washington, DC 20036
202-332-2200
202-332-2302 (fax)
<http://www.zpg.org>

High school. \$19.95 plus \$3 shipping and handling. 177 pages, 1991.

Twelve readings and 32 activities introduce high school students to global environmental issues, challenging them to critically evaluate issues, and motivating them to develop solutions.

Notes: Looks at global issues and problems such as population, distribution of wealth, and ethics. Can be used across the curriculum in a variety of subject areas. Nice summary of activities for easy reference at the beginning of the book. Good as a starting point in a unit. Limited hands-on activities.

ENERGY ACTION ACTIVITIES

National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
801-539-1406/ 1-800-616-TEAM
801-539-1451 (fax)
<http://www.nes1.org>
e-mail: info@nef1.org (can send orders via e-mail)

Grades 4-8. \$12 plus \$3 shipping and handling (10% for orders of \$30 or more). Teachers receive a 20% discount upon request. 77 pages, 1993.

The activities are designed to help teach students about energy and the environment. Family participation is encouraged in each activity.

Notes: Strong focus on conservation. Suited for home-school connections, not for use in school. Encourages environmental awareness through ethical choices. Interesting variety of activities. Format is appealing to students. Does not indicate age or grade level.

Supplementary Materials

ELEMENTARY ENERGY AND ENVIRONMENT SCIENCE ACTIVITIES BOOK V

Department of Environmental Protection
Office of Pollution Prevention and Compliance Assistance
P.O. Box 2063
400 Market St., 16th floor
Harrisburg, PA 17105-2063
717-783-0540
717-783-2703 (fax)
<http://www.dep.state.pa.us>

Grade-level designation is left to the teacher's discretion.
Free. 99 Pages, 1997.

The activities are designed to help teachers incorporate energy concepts into the curriculum.

Notes: An abundance of activity sheets to supplement a primary unit on energy. Some good supplements to an energy unit. Worksheet oriented and teacher directed. Includes an interesting vocabulary list showing the Greek and Latin origins of words. Includes ideas for energy bulletin boards.

ENERGY ACTION PATROL

National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
801-539-1406/ 1-800-616-TEAM
801-539-1451 (fax)

<http://www.nes1.org>
e-mail: info@nef1.org (can send orders via e-mail)

Grades 5-8. \$450 (plus 10% shipping and handling). Teachers receive a 20% discount upon request. 1995.

This kit includes program guidelines, instructions, and other support materials for Student Energy Action Patrols to conduct regularly scheduled school energy audits.

Notes: Filled with action activities that students can complete; puts energy conservation into perspective. Includes very little background for the teacher. Activities are mostly individually structured; few opportunities for real cooperative learning to occur. Although assessment seems to be imbedded in the curriculum, there is no direction given to the teacher. Good, explanatory video. Relies heavily on reading; no provisions given for Limited English Proficiency students. This program involves students in monitoring their school energy usage and encourages them to continue these efficiency and conservation measures at home.

ENERGY ACTION TEAM

National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
801-539-1406/ 1-800-616-TEAM
801-539-1451 (fax)
<http://www.nes1.org>

e-mail: info@nef1.org (can send orders via e-mail)
Grades 6-9. \$100 (plus 10% shipping and handling). Teachers receive a 20% discount upon request. 1995.

This program provides young adults the opportunity to work as a team in research, preparation, and submittal of a school energy efficiency policy.

Notes: Students participate in this program directly; in that sense, it may be empowering...they can make a difference. This is a good collection of energy awareness activities which include a parent involvement component. The idea of earning Eco Action points toward a goal could be very motivating for students. To use this book with any meaning, it would be necessary to have taught the 4-6th grade materials, which provide the theoretical background.

ENERGY ACTION TECHNOLOGY

National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
801-539-1406/ 1-800-616-TEAM
801-539-1451 (fax)
<http://www.nes1.org>
e-mail: info@nef1.org (can send orders via e-mail)

Grades 9-12. \$150 (plus 10% shipping and handling). Teachers receive a 20% discount upon request. 1995.

This program teaches advanced energy concepts and how energy technologies related to society connect with the lives of young adults as they are beginning to make the transition from school to work.

Notes: Each section is very thorough and can easily be integrated into existing curricula. Some sections contain lessons that can be brought into all grades 9-12. Good infusion of economics. Teacher

introduction coordinates lessons to California state frameworks. It is ideal for an interdisciplinary, project-based curriculum. This material has the potential to spark interest in a wide range of students with various learning styles and academic goals. Open-ended activities allow for student decision making practice.

ENERGY FUN PROGRAM

ORDERING INFORMATION AND COST

National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
801-539-1406/ 1-800-616-TEAM
801-539-1451 (fax)
<http://www.nes1.org>
e-mail: info@nef1.org (can send orders via e-mail)

Grades K-3. \$80 (plus 10% shipping and handling). Teachers receive a 20% discount upon request. 1995.

This guide's thirty-one activities, puzzles, games, and posters support state core curriculum requirements and offer basic energy use concepts to capture the attention of young students.

Notes: Good introduction to the overall concept of energy for primary students. Broad range of lessons incorporating many energy concepts. Lessons are easy to follow. Extensive energy glossary. Lessons are appropriate for grades 2-3. Teachers can earn college credit for completing projects related to the curriculum with their students. Good teacher background on different energy resources. Lessons are basically well organized.

Supplementary Materials

ENERGY FUNDAMENTALS

National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
801-539-1406/ 1-800-616-TEAM
801-539-1451 (fax)
<http://www.nes1.org>
e-mail: info@nef1.org (can send orders via e-mail)

Grades 4-6. \$80 (plus 10% shipping and handling). Teachers receive a 20% discount upon request. 1995.

This guide's thirty-one hands-on activities, games, and puzzles support state core curriculum requirements and offer basic fundamental energy and natural resource concepts to capture the attention of young students.

Notes: The book begins with a clear, four page conceptual framework which clearly outlines the seven strands in the material. Twenty pages of in-depth text explain energy basics for the teacher. The posters are quite usable as a teaching tool. The student lab activity and work pages are great, containing clearly drawn and labeled diagrams that present energy concepts in a variety of interesting ways. This curriculum focuses on use of energy and natural resources as well as energy management and awareness.

ENERGY SKILL BUILDERS (several titles): *Electricity From Water, Wind, and Sunlight* (5-7); *Is Efficiency Our Best Energy Source?* (9-11); *Paths for Electricity* (3-5); *Sources of Electricity* (4-6); *The Treehouse Team Saves the Forest* (2-3); and *Using Our Resources Wisely* (4-6)

Enterprise for Education
1316 Third St., Suite 103
Santa Monica, CA 90401
310-394-9864
310-394-3539 (fax)
e-mail: entford@aol.com

Sources of Electricity is available on the internet at:
www.sourcesofelectricity.com

Free copies of any/all booklets may be available from your local electric utility company. Booklets including student activities and information can be ordered from Enterprise for Education for \$1.00 each, teacher guides for \$1.90 each.

Notes: Good mini units to supplement an energy curriculum. Hands-on activities for all grade levels. High quality student materials. Pictures and text are interesting. Some activity ideas are included. Could supplement other units. Each unit is a different length and presentation.

GLOBAL WARMING AND THE GREENHOUSE EFFECT

GEMS
Lawrence Hall of Science
University of California
Berkeley, CA 94720-5200
510-642-7771
510-643-0309 (fax)
<http://www.lhs.berkeley.edu>

Grades 7-10. \$16 (does not include tax or shipping and handling); 174 pages.

This guide is designed to help teachers communicate the basics about global warming and the greenhouse effect to students through laboratory activities, simulations, and discussions.

Notes: Great, inexpensive activities to emphasize the chemistry and physics of global warming. Well laid out and organized. Comprehensive on the topic. Illustrates the concept well. Includes a great literature list. Ends with a mock international conference to discuss global warming issues.

GREEN SCHOOLS ENERGY PROJECT

Youth For Environmental Sanity
706 Frederick St.,
Santa Cruz, CA 95062
408-662-0793
408-662-0797 (fax)
e-mail: yes@cruzio.com
<http://www.yesworld.org>

Grades 7-12. \$5.00 for Green Schools Manual. 28 pages, 1994. Call to set up assembly performances. Organization also holds summer camps for ages 15-25 in New Hampshire, Oklahoma, Montana, California, Oregon, and Washington. This book contains a step-by-step guide for implementing an energy-saving project in a school district, and supplemental fact sheets on related energy topics.

Notes: Very practical guide to saving energy at school. Steps are easily followed. Good school-wide service project. This guide offers an overview of the procedure to perform an audit and change how the school uses energy. Forms for the audit were presented well. Offers good ideas for doing school projects.

MOUSE HOUSE SURPRISE

Enterprise for Education
1316 3rd St., Suite 103
Santa Monica, CA 90401
310-394-9864
310-394-3539 (fax)
e-mail: entfored@aol.com

Grades K-2. Oversized book \$8.25 each, small book \$1.00 each; 32 pages, 1993.

This “big book” story and accompanying student booklet introduces students to electricity, appliances that use electricity, and basic electrical safety.

Notes: The text is simple enough for most students to read. Students get their own book to read and write in. Attractive “big book” presentation for introduction to the word “electricity,” including where it comes from and its uses. Grade level appropriate activities. Good safety information for young children. As a piece of a theme it would be helpful. Nondogmatic way to get concepts across.

NATIONAL ENERGY EDUCATION DEVELOPMENT PROJECT (several titles): *A Current Energy Affair* (7-12), *Blueprint for Success* (4-12), *Elementary/Middle School Energy Fact Sheets* (4-8), *Energy Around the World* (5-9), *Energy Enigma* (7-12), *Energy Jeopardy* (5-12), *Secondary Energy Fact Sheets* (7-12), *The Great Energy Debate Game* (5-12), *The Museum of Solid Waste and Energy* (5-12), *The Science of Energy* (7-12), *The Science of Energy Elementary Version* (5-8), *Transparent Energy* (7-12), *Project Activities* (4-12), and *Yesterday in Energy* (5-9).

Supplementary Materials

Also fact sheets, project activities, and an “energy carnival” (including games and projects) for primary grades.

The National Energy Educational Development Project
P.O. Box 2518
Raston, VI 22090
703-860-5029
703-471-6306 (fax)
www.energyconnect.com/need

Grades 4-12. \$35 per year to join (includes membership fee plus 6 free items from the catalogue, subscription to biannual magazine, and eligibility for awards). All materials, conferences, and memberships are available free to teachers in Long Beach Unified School District (California), Kern County (California), and Ventura County (California).

These modules can be used to create an energy education program for one or several grade levels.

Notes: Interesting ideas for hands-on centers. Packets are set up by topic and grade level so the teacher can customize the program. Large number of pamphlets to manipulate (48 in the complete series). Would take a lot of teacher preparation time sorting through the guides and learning an order and approach to teaching this. These activities are designed to develop student’s science, math, language arts, and social studies skills and knowledge while emphasizing energy. Activities look creative, fun, and engaging.

RENEWABLE ENERGY FACT SHEETS

Solar Energy Industries Association
777 N. Capitol St. NE, Suite 805
Washington, DC 20002
202-383-2600
202-383-2670 (fax)
<http://www.seia.org>

\$5 per copy plus \$2.50 shipping and handling. 30 pages.

This collection of fact sheets and student activities were developed by renewable energy experts. The material can be photocopied for classroom use.

Notes: Designed for teacher use; reading level is difficult for most high school students. Assumes much prior knowledge. Gives good background information on sources of renewable energy. One activity per energy source is presented to emphasize the information.

SCIENCE PROJECTS IN RENEWABLE ENERGY AND ENERGY EFFICIENCY

National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
801-539-1406/ 1-800-616-TEAM
801-539-1451 (fax)
<http://www.nes1.org>
e-mail: info@nef1.org (can send orders via e-mail)

Grades K-12. \$10 each plus shipping and handling. Teachers receive a 20% discount upon request. 139 pages, 1991.

This book focuses on experimental projects that emphasize the scientific method.

Notes: Excellent supplement. Good source for teachers who are new to science projects. Useful in putting together a science fair—provides students with some ideas. Good background information for teachers and high school students. Probably the usefulness of this book increases with the age of the student. List of supplementary materials has been provided to assist teachers. The ideas for projects are creative and somewhat open ended.

SCIENCE, SOCIETY, AND AMERICA'S NUCLEAR WASTE
(two titles): **THE NUCLEAR WASTE POLICY ACT AND THE WASTE MANAGEMENT SYSTEM**

Office of Civilian Radioactive Waste Management (OCRWM)
Information Center
Attn: Curriculum Department
4101B Meadows Lane
Las Vegas, NV 89107
1-800-225-6972
<http://www.ymmp.gov>

Grades 10-12. Free. 1995.
These units are part of a four-unit secondary curriculum addressing scientific and societal issues related to the management of spent nuclear fuel.

Notes: Good lessons using statistical analyses. Some good background information for teachers. Some very dry writing. Students would need background in geology, graphing, mapping, geography, and waste management for this to be meaningful. Earth science teachers would like the lab activities. Integrated science. Good map activities. No environmentalists or anti-nuclear folks are in the list of stakeholders.

UNDERSTANDING ELECTRICITY KIT

National Energy Foundation
5225 Wiley Post Way, Suite 170
Salt Lake City, UT 84116
801-539-1406/ 1-800-616-TEAM
801-539-1451 (fax)
<http://www.nes1.org>
e-mail: info@nef1.org (can send orders via e-mail)

Grades K-6. \$10 plus \$3 shipping and handling (10% shipping and handling for orders of \$30 or more). Teachers receive a 20% discount upon request. 1989.

A collection of ten lesson plans presented without structure for teachers to supplement instruction as they find appropriate.

Notes: Several primary activities on energy that are grade level appropriate. Nice poster of how energy serves communities. Seems to be a gap between easier and harder concepts. Explains electricity for novices. Lessons can be integrated into current curriculum. Easy to use.

Environmental Education Curriculum and Compendium Project Overview

During the last twenty years, a vast number of environmental education materials have been developed in the United States for the K-12 classroom. Produced by a variety of individuals, agencies, and institutions, these curricula are of varying quality and value to the classroom teacher. Selecting and implementing suitable curricula is, at best, a demanding, complex, and challenging process. To facilitate and encourage the implementation of high quality curricula, the Office of Environmental Education within the California Department of Education (CDE) instituted the Curricula and Compendia project. A project advisory group, made up of representatives from a number of state agencies and offices, established the following project tasks: (1) collect curricula through nation-wide searches; (2) evaluate the quality of curricula using an appropriate assessment instrument; (3) publish the results of the evaluations in topic-specific compendia that use a descriptive, ranking format; and (4) develop and implement strategies for distribution of the publications to educators across California.

To make this curricula review manageable, seven topic areas were logically delineated: Energy Resources, Water Resources, Integrated Waste Management, Air Quality, Human Communities, Plant and Animal Communities, and Terrestrial and Aquatic Habitats (the latter two were later combined to form Natural Communities). The *Energy Resources* and *Water Resources* compendia were published in 1992 and the *Integrated Waste* compendium was published in 1993. The *Air Quality* and *Human Communities* compendia were published in 1994 and the *Natural Communities* compendium was published in 1995. The *Energy Resources* and *Water Resources* compendia have both been completely redone in 1996.

The evaluation phase of the Curricula and Compendia Project utilizes four strategies: (1) development of a “Unifying Concepts of

Environmental Education” matrix by the CDE to serve as a cornerstone linking the project’s six topics; (2) formation of an advisory group of experts for each project to create a topical “Conceptual Matrix” that aligns to the Unifying Concepts; (3) elaboration of topic-specific curricula evaluation questions that are directly correlated to the Conceptual Matrix; and (4) systematic evaluation and ranking of environmental education curricula. When considered together, the conceptual matrices for the six compendia provide an extensive yet cohesive foundation upon which curriculum writers, environmental educators, and school administrators can base further instructional materials development in environmental education.

Conceptual Matrices for Environmental Education

Both the “Unifying Concepts of Environmental Education” and the “Conceptual Matrix for Energy Resources” illustrated on the following pages are based upon the CDE environmental education philosophy described in the “Point of View on Environmental Education” (1990). The “Unifying Concepts of Environmental Education” serve to provide a conceptual foundation for defining the boundaries of all environmental education. On the “X” axis are found three content descriptors: The Natural Environment, The Built Environment, and The Personal Environment. On the “Y” axis are three process skills that encompass the full range of cognitive and affective change: Fostering Awareness, Understanding Concepts, and Taking Action.

In the conceptual matrix for this compendium the nine core concepts identified define the boundaries of, and expectations for, energy resources curricula.

Because environmental education is an interdisciplinary subject, the basic concepts of energy resources correspond, to some degree, to almost all the frameworks for California public schools and reflect the underlying philosophy of the California Education Code. Framework correlation have been documented on page XXX.

Unifying Concepts of Environmental Education

<div>Content</div> <div>Process</div>	THE NATURAL ENVIRONMENT: Natural Systems and Interactions	THE BUILT ENVIRONMENT: Human Alterations to Natural Environments	THE PERSONAL ENVIRONMENT: Citizens' Roles, Responsibilities, Choices, and Actions
Fostering Awareness: Awareness and Respect for the Environment	Individuals are aware that all living things require energy. They can identify the origin and use of standard and alternative energy sources.	Individuals differentiate between renewable and non-renewable energy resources. The use of these resources may affect economic productivity, human comfort and the quality of the environment.	Citizens are aware that their quality of life is influenced by energy-related decisions and actions that may be regulated by laws and influenced by local interests, cultural values, political climate and international relations.
Understanding: Understanding Basic Environmental Concepts	Individuals understand that energy resources may be renewable, such as those derived from water, the sun and the wind, or they may be non-renewable, as found in fossil fuels.	Individuals understand the relationship between energy development, production, distribution, and use with respect to long- and short-term environmental, socioeconomic and cultural consequences.	People generate demands for specific types of energy through their expectations for energy-dependent goods and services, their lifestyle choices and their personal use of energy.
Responsible Actions: Taking Responsible Action Toward the Environment	Individuals make informed choices and take appropriate action to ensure the availability of future supplies of renewable and non-renewable energy resources. They use energy efficiently to minimize their effect on the environment.	Individuals use energy-efficient methods and innovative technologies to conserve non-renewable resources and minimize the impact of energy development, production, distribution and use on human health and the environment.	Informed citizens apply a personal energy ethic to every aspect of their lives. Their ethic is expressed through efficient energy use, compliance with regulations and support for conservation and protection of energy resources. Energy related decisions include analysis of the cost/benefit trade-offs and long-term effects on the natural and built environments.

Conceptual Matrix Framework Correlations

<div>Content</div> <div>Process</div>	FOSTERING AWARENESS AND RESPECT FOR THE ENVIRONMENT	UNDERSTANDING BASIC ENVIRONMENTAL CONCEPTS	TAKING RESPONSIBLE ACTION TOWARD THE ENVIRONMENT
THE NATURAL ENVIRONMENT: Natural Systems and Interactions	Science: Physical Science; Earth Science, Life Science. Physical Education: Social Development and Interaction. Visual and Performing Arts: Aesthetic Perception; Aesthetic Valuing. History/Social Science: Knowledge and Cultural Understanding; Skills Attainment and Social Participation; Democratic Understanding and Civic Values.	Science: Physical Science; Earth Science, Life Science. Visual and Performing Arts: Aesthetic Perception; Aesthetic Valuing. Health: Consumer and Community Health; Environmental Health. History/Social Science: Knowledge and Cultural Understanding; Skills Attainment and Social Participation. English/Language Arts: The Art of Questioning. Mathematics: Mathematical Thinking; Mathematical Tools and Techniques.	Science: Physical Science; Earth Science. Physical Education: Social Development and Interaction; Individual Excellence. Visual and Performing Arts: Aesthetic Perception; Aesthetic Valuing. Health: Consumer and Community Health; Environmental Health, Individual Growth and Development. History/Social Science: Knowledge and Cultural Understanding; Skills Attainment and Social Participation; Democratic Understanding and Civic Values. English/Language Arts: The Art of Questioning. Mathematics: Mathematical Thinking; Mathematical Tools and Techniques.
THE BUILT ENVIRONMENT: Human Alterations to Natural Systems	Science: Physical Science; Earth Science, Life Science. Physical Education: Social Development and Interaction. Visual and Performing Arts: Aesthetic Perception. Health: Environmental Health. History/Social Science: Knowledge and Cultural Understanding; Skills Attainment and Social Participation. English/Language Arts: The Art of Questioning. Mathematics: Mathematical Thinking; Mathematical Tools and Techniques.	Science: Physical Science; Earth Science, Life Science. Physical Education: Social Development and Interaction. Visual and Performing Arts: Aesthetic Perception. Health: Consumer and Community Health; Environmental Health. History/Social Science: Knowledge and Cultural Understanding; Skills Attainment and Social Participation. English/Language Arts: The Art of Questioning. Mathematics: Mathematical Thinking; Mathematical Tools and Techniques.	Science: Physical Science; Earth Science, Life Science. Physical Education: Individual Excellence. Visual and Performing Arts: Aesthetic Perception; Creative Expression; Aesthetic Valuing. Health: Consumer and Community Health; Environmental Health, Individual Growth and Development. History/Social Science: Skills Attainment and Social Participation. English/Language Arts: The Art of Questioning. Mathematics: Mathematical Thinking; Mathematical Tools and Techniques.
THE PERSONAL ENVIRONMENT: Citizens' Roles, Responsibilities, Choices, and Actions	Science: Physical Science; Earth Science. Visual and Performing Arts: Aesthetic Perception; Aesthetic Valuing. Health: Consumer and Community Health; Environmental Health. History/Social Science: Knowledge and Cultural Understanding; Skills Attainment and Social Participation; Democratic Understanding and Civic Values. English/Language Arts: The Art of Questioning.	Science: Physical Science. Physical Education: Social Development and Interaction. Visual and Performing Arts: Aesthetic Perception; Aesthetic Valuing. Health: Environmental Health. History/Social Science: Knowledge and Cultural Understanding; Skills Attainment and Social Participation; Democratic Understanding and Civic Values. Mathematics: Mathematical Thinking; Mathematical Tools and Techniques.	Science: Physical Science; Earth Science, Life Science. Physical Education: Individual Excellence. Visual and Performing Arts: Aesthetic Perception; Creative Expression; Aesthetic Valuing. Health: Consumer and Community Health; Environmental Health, Individual Growth and Development. History/Social Science: Knowledge and Cultural Understanding; Skills Attainment and Social Participation; Democratic Understanding and Civic Values. English/Language Arts: The Art of Questioning. Mathematics: Mathematical Thinking; Mathematical Tools and Techniques.

Energy Resources Evaluation Tool

The environmental education evaluation tool used to evaluate the Energy Resources curricula is based on the recommendations and perspectives of the compendia's advisory committee as well as the following documents:

1992 Science Instructional Materials Evaluation Form, California Department of Education, 1992.

Andrews, Bill, *Background Paper I: Environmental Education Strategy of the California Department of Education*, California Department of Education.

Energy Education Evaluation Form - the evaluation tool used for the Water Resources and Energy Resources compendia published in 1992.

Gardella, Ron, *Environmental Education Curriculum Inventory* (Forms A and B), Northern Kentucky University, Highland Heights, KY, 1992.

Health Framework for California Public Schools (pp. 184-195), California Department of Education, 1994.

History-Social Science Framework for California Public Schools (pp. 114-120), California Department of Education, 1988.

Niedermeyer, Fred, *A Checklist for Reviewing Environmental Education Programs* (pp. 46-50), *Journal of Environmental Education*, Vol. 23, 1992.

Olson, Betsy, *Environmental Education Instructional Materials Evaluation Form*, California Department of Education (draft).

Science Framework for California Public Schools (Chapter 8, pp. 198-213), California Department of Education, 1990.

Science Resource Center, *Rating System for ME-2*, Los Angeles Unified School District.

The Superintendent's Point of View on Environmental Education, California Department of Education 1990.

UNESCO, *The Belgrade Charter*, UNESCO-UNEP Environmental Education Newsletter, Volume 1, Number 1, January, 1976.

UNESCO, *The Tbilisi Declaration*, October 1977.

I. Criteria for Instructional Materials

A. General Content

1. Are ideas expressed through unifying themes and big ideas, not facts?
2. Is content interdisciplinary?
3. Are students challenged to utilize higher level thinking processes (i.e., inferring, relating, and applying)?
4. Are ideas presented logically and connected through the curriculum?
5. Is depth of understanding emphasized (rather than encyclopedic breadth)?

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6. Are historical, ethical, cultural, geographic, economic, and sociopolitical relationships addressed?
 7. Are knowledge and learning shown as connected to students' lives and society?

B. Presentation

1. Are instructional materials clearly and engagingly written with the main concepts well articulated?
2. Are the roles of environmental ethics, citizenship, and stewardship explored?
3. Do lessons promote respect and caring for the environment, yet are nondogmatic and open to inquiry and differences of opinion?
4. Are personal and societal values and conflicting points of view explored in context?
5. Are instructional materials easy for students to use and understand?
6. Is learning made accessible to LEP students?
7. Are writing and concepts developmentally appropriate for the designated grade, yet sensitive to individual differences in educational experience and learning mode?
8. Is environmental responsibility modeled in design, underlying philosophy, and suggested activities by the

lessons and materials (e.g., using recycled materials and properly disposing of wastes)?

9. Are there clear linkages presented between communities of all levels? (“thinking globally, acting locally.”)
10. Are vocabulary words defined in context and not dominating of learning goals?
11. Is the layout of instructional materials interesting and appealing?

C. Pedagogy

1. Does at least half the curriculum have students engaged in active learning?
2. Is learning based on students constructing knowledge through research, discussion, and application to gain conceptual understanding?
3. Are evaluation devices included and appropriate? (Highest points for authentic, performance based assessment devices.)
4. Are instructional materials sensitive to social, economic, and cultural diversity?
5. Do lessons encourage students to develop awareness, knowledge, and strategies for responsible action?
6. Are group/cooperative learning strategies used?

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7. Is intergenerational responsibility, linking today's actions with future consequences, implicit in instruction?

D. Teacher Usability

1. Are instructions for the teacher clear and concise?
2. Are lesson objectives/outcomes clear and appropriate?
3. Are materials easily integrated into an established curriculum?
4. Is background information for the teacher adequate and accurate?
5. Can the materials be adapted to varied learning environments (large/small classes, of mixed levels, from rural/urban settings.)?
6. Are consumable instructional materials of good quality, easily duplicated for student use, and in sufficient quantity to support the objectives?
7. Are equipment/materials listed and reasonably accessible?
8. Are a variety of instructional strategies, expanded learning environments, and resources suggested in the curriculum's design?
9. Is the time required to complete each lesson indicated?

10. Do the materials clearly list the subject discipline(s) integrated into each lesson?

E. Energy Resources Content Questions

Do the materials provide opportunities for students to:

1. Appreciate that energy is essential for all living things?
2. Understand the differences between renewable and nonrenewable energy resources?
3. Practice taking appropriate action to limit the environmental impacts of energy development, production, distribution, and use through energy conservation?
4. Relate human comfort, economic productivity, and environmental quality to energy use?
5. Understand new energy-efficient technologies and their expected impact on future energy supplies?
6. Consider and analyze the environmental, socioeconomic, and cultural consequences of human energy utilization?
7. Explore some of the impact of today's energy choices on future energy availability?
8. Appreciate that today's energy choices and society's actions will impact the future quality of life?

9. Understand energy conservation methods that promote sustainable levels of energy use?
10. Develop a personal energy ethic that enables informed and responsible decision making and action taking?

II. Narrative/Miscellaneous Questions

In thinking back on the materials you've just evaluated:

1. Briefly comment on the strengths of the materials.
2. Briefly comment on the weaknesses of the materials.
3. Put a check mark next to the specific energy resource issues that the evaluated material addressed:

solar
 conventional (fossil fuel burning)
 hydroelectric
 cogeneration
 wind
 nuclear
 ocean tide
 biomass conversion
 geothermal
 environmental damage
 waste production
 waste storage
 sustainable energy use
 other (what?)

4. Other comments.
5. When considering today's energy issues, are the materials so site specific that they cannot be adapted to the needs of California's classroom teachers? If so, why not?
6. Besides English, in what other languages are the materials available? If not entirely translated, what parts?
7. Do the materials contain a listing of resources, such as in an appendix or teacher resource guide?
8. In the table below, place a check mark in the appropriate box across from each discipline to indicate the amount of emphasis each is given in the curriculum.

EMPHASIS	NONE	SOME	A LOT	MAJOR
DISCIPLINE				
Science				
History/Social Studies				
Health				
Mathematics				
fine/Performing Arts				
Language Arts				
Industrial				
Tech/Voc. Ed.				
Foreign Language				
Other (specify)				